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LOMA LINDA UNIVERSITY
School of Behavioral Health
in conjunction with the
Faculty of Graduate Studies

The Influence of Parental Mental Health on Child Outcomes:
The Role of the Parenting Process

by

Meredith L. Dennis

A Thesis submitted in partial satisfaction of
the requirements for the degree
Doctor of Philosophy in Clinical Psychology

March 2016

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Each person whose signature appears below certifies that this thesis in his/her opinion is adequate, in scope and quality, as a thesis for the degree Doctor of Philosophy.

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CONTENT

Approval Page.....	iii
Acknowledgements.....	iv
List of Figures	viii
List of Tables	x
List of Abbreviations	xi
Abstract.....	xiii
Chapter	
1. Overview.....	1
Introduction.....	2
Parental Mental Health Among Parents of Children with DD	2
The Role of the Parenting Process	5
Child Development and Behavior Problems among Children with DD.....	8
The Interplay between Parental Mental Health and the Parenting Process	11
The Interplay between the Parenting Process and Child Outcomes	12
Optimizing the Parenting Process: The Role of Mindfulness-Based Stress Reduction.....	13
The Current Study.....	15
2. Method	17
Participants.....	17
Procedure	19
Measures	20
Demographic Variables	20
Qualitative Questionnaire	21
Parenting Stress Index.....	21
Parenting Satisfaction Scale.....	22
Parenting Relationship Questionnaire.....	23
Parenting Practices Interview	23
Child Behavior Checklist.....	24
Social Skills Improvement System	24

Data Analytic Plan	25
Qualitative Data	26
Quantitative Data	27
3. Results	29
Qualitative Data	29
Parenting Stress	29
Parenting Practices and Ability	30
Child Behavior and Development	31
Qualitative Data	32
Parental Role Expectation and Satisfaction	34
The Parent-Child Relationship	35
Parenting Behavior and Practices	38
4. Discussion	40
Limitations and Future Directions	46
Conclusions	49
References	51

FIGURES

Figures	Page
1. Theoretical model for the proposed relationship between parenting stress and child developmental outcomes mediated by the parenting process	2
2. Mediation model predicting child behavior problems from parental distress through the effect of parent-child relational frustration.....	37

TABLES

Tables	Page
1. Demographic Characteristics of Participants from Phase 1 and Phase 2 of the MAPS Study	21
2. Correspondence between Qualitative Outcomes and Measure Subscales Chosen as Quantitative Indicators	33
3. Results of Mediation Analyses Testing the Components of the Parenting Process as Mediators of the Relationship Between Parental Distress and Child Behavior Problems	35
4. Results of Mediation Analyses Testing the Components of the Parenting Process as Mediators of the Relationship Between Parental Distress and Child Social Skills Development	38

ABBREVIATIONS

DD	Developmental Delay
TD	Typically Developing
MBSR	Mindfulness-Based Stress Reduction
MAPS	Mindful Awareness for Parenting Stress
PSI	Parenting Stress Index
PSS	Parenting Satisfaction Scale
PRQ	Parenting Relationship Questionnaire
PPI	Parenting Practices Interview
CBCL	Child Behavior Checklist
SSIS	Social Skills Improvement System
BCa CI	Bias-Corrected and Accelerated Confidence Interval

ABSTRACT OF THE THESIS

The Influence of Parental Mental Health on Child Outcomes: The Role of the Parenting Process

by

Meredith L. Dennis

Doctor of Philosophy, Graduate Program in Clinical Psychology
Loma Linda University, March 2016
Dr. Cameron L. Neece, Chairperson

Parents of children affected by developmental delays (DD) have been shown to experience elevated levels of parenting stress compared to parents of typically developing children. Recent studies suggest that higher levels of parenting stress can adversely impact child behavior and development, such that higher levels of parenting stress are often associated with higher levels of behavior problems and negative developmental outcomes. However the specific mechanisms through which parenting stress influences child outcomes remain unclear. The overall parenting process may be one potential medium through which parenting stress influences both child behavioral and developmental outcomes. The current study involved both qualitative and quantitative data from the Mindful Awareness for Parenting Stress (MAPS) Project, a randomized controlled trial examining the efficacy of Mindfulness Based Stress Reduction (MBSR) in reducing parental stress and subsequent child behavior problems. Participants included 96 parents of children, ages 2.5 to 5 years old, with DD. Results of the directed content analysis for qualitative data indicated that parents experienced significant improvements across levels of parenting stress, parenting behavior, and child behavior and development. Subsequent results of multiple mediation analyses indicated that one component of the

parent-child relationship, parent-child relational frustration, significantly mediated the relationship between parenting stress and child outcomes, such that higher parental distress led to increased relational frustration, which in turn led to higher child behavior problems. Components of parental role expectation and satisfaction and parenting behavior were not found to be significant mediators to the relationship between parenting stress and child behavior and development. Recognizing that parent-child relational factors such as these impact the relationship between heightened parenting stress and adverse behavioral outcomes among children with DD will allow interventions to be developed that not only target reducing parenting stress, but specifically target improving the parent-child relationship with the ultimate goal of decreasing behavior problems and increasing developmental gains among children with DD.

CHAPTER ONE

OVERVIEW

Parents of children affected by developmental delays (DD) have been shown to experience elevated levels of parenting stress compared to parents of typically developing children (Baker et al., 2003; Emerson, 2003; Hauser-Cram, Warfield, Shonkoff, & Krauss, 2001; Oelofsen & Richardson, 2006; Neece, Green, & Baker, 2012). Recent studies suggest that higher levels of parenting stress can adversely impact children's behavior and development, such that higher levels of parenting stress are often associated with more behavior problems and less developmental progress (Ayoub, Vallotton, & Mastergeorge, 2011; Baker et al., 2003; Brummelte, Grunau, Synnes, Whitfield, & Petrie-Thomas, 2011; Neece, et al., 2012). However the specific mechanisms through which parenting stress influences child behavior and development remain unclear. The overall child-rearing process involved in parenting a child with DD may be one potential medium through which parenting stress influences both child behavioral and developmental outcomes. More specifically, (a) parental role expectation and satisfaction related to raising a child with DD, (b) the parent-child relationship, and (c) parenting behavior, are three specific components of the parenting process that may mediate the relationship between parenting stress and child behavior and development. Given that disruptions to these areas of the parenting process may provide evidence for adverse developmental and behavioral outcomes among children with DD, the aim of the current study was to both quantitatively and qualitatively examine the mechanisms through which parental mental health impacts the parenting process, and, in turn, influences behavior and development in children with DD (see Figure 1).

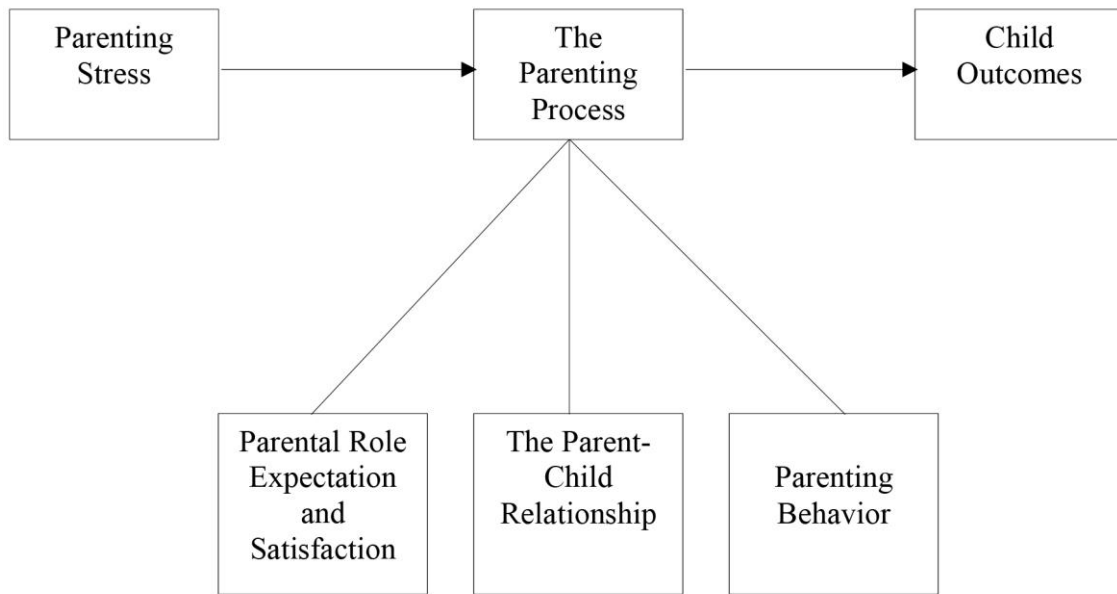


Figure 1. Theoretical model for the proposed relationship between parenting stress and child developmental outcomes mediated by the parenting process.

Introduction

Parental Mental Health among Parents of Children with DD

Parental mental health is one factor that has been shown to significantly impact child behavior and development. It is well documented that parents of children affected by DD report considerably more parenting stress than parents of typically developing children (Baker et al., 2003; Emerson, 2003; Estes et al., 2009; Gerstein, Crnic, Blacher, & Baker, 2009; Hauser-Cram et al., 2001; Oelofsen & Richardson, 2006). The elevated levels of stress experienced by these parents may often be in the clinical range and show a chronic, persistent trajectory (Crnic, Gaze, & Hoffman, 2005; Gerstein et al., 2009; Oelofsen & Richardson, 2006; Tervo, 2012; Webster, Majnemer, Platt, & Shevell, 2008), which in turn can lead to the development of more adverse mental health outcomes such

as maternal depression (Deater-Deckard, Dodge, Bates, & Pettit, 1998). Mothers suffering from depression are often less able to effectively cope with situations, have less social support, and experience cognitive distortions that increase negative perceptions of stressors and major life events associated with motherhood (Murray, 1992). Parents who experience persistent stress may show less effective coping mechanisms, increased emotional problems, decreased maternal self-efficacy, more authoritarian parenting styles, and both negative interactions and decreased involvement with their children (Crnic et al., 2005; Crnic & Low, 2002; Deater-Deckard & Scarr, 1996; Hauser-Cram et al., 2001).

Although compromised parental mental health creates a multitude of negative health outcomes for parents, the consequences experienced by their children may be even more detrimental. In particular, children of depressed mothers have been shown to experience various developmental impediments, including insecure attachments, delays in cognitive and language development, and disturbances in overall social-emotional functioning (Cooper & Murray, 1998; Grace, Evindar, & Stewart, 2003; Muñoz, Le, & Ippen, 2007; Petrou, Cooper, Murray, & Davidson, 2002). Furthermore, children of parents who experience elevations in parenting stress are at risk for a multitude of unfavorable outcomes including increased internalizing and externalizing behavior problems, decreased social competence, and more negative parenting (Anthony et al., 2005; Donenberg & Baker, 1993; Neece, Green, & Baker, 2012). Regarding the relationship between parenting stress and child problem behavior, research has also indicated a strong, mutually escalating and reciprocal relationship between parenting stress and child behavior problems, such that increases in parenting stress lead to

increases in child behavior problems and increases in behavior problems subsequently lead to increases in parenting stress (Baker et al., 2003; Neece et al., 2012).

Although studies examining stress outcomes for parents and children have conceptualized stress in various ways including the daily hassles model (Crnic & Greenberg, 1990), major life stressors (Crnic et al., 2005), stress resulting from financial hardship (Gershoff, Aber, Raver, & Lennon, 2007), and stress related to child developmental outcomes (Gerstein et al., 2009), the current study focused on the theoretical model of parenting stress that corresponds to the Parenting Stress Index- Short Form (PSI-SF) developed by Abidin (1995). According to this model, the total stress a parent experiences is a function of child and parent characteristics as well as situational factors directly related to the role of being a parent. Specifically, this model accounts for parental distress, parent-child dysfunctional interaction, and difficult child stress.

Parental distress is associated with various stressors related to parenting roles including impaired sense of parenting competence, stress associated with the restrictions placed on life roles outside of parenting, conflict with the child's other parent, lack of social support, and presence of depression. The dysfunctional parent-child interaction component of the model focuses on the parent's perception that the child does not meet the parent's expectations and interactions with the child are not reinforcing to him or her as a parent. In terms of the difficult child component, the PSI-SF Model assumes that having a behaviorally or temperamentally difficult child leads to disruptions in parent child interactions and parenting behavior. Collectively, the theoretical model for the PSI-SF views parenting stress as being determined by personal parental distress, stress that

stems from parent-child interactions, and stress that results from the child's behavioral characteristics (Abidin, 1995).

The Role of the Parenting Process

Parenting is a complex and ever-changing process that can be drastically impacted by having a child affected by DD, as these children often pose greater challenges to parenting in a number of domains. It is not often the case that parents anticipate having a child with DD, thus parental role expectation and satisfaction can be altered merely by the presence of a delay. Research has suggested that parental ideas and expectations will not automatically change with the presentation of new information, such as a diagnosis of DD. Rather, parents' expectations about how they will parent their children often operate through behavioral choices and interactions with others, ultimately allowing them to generate more informed expectations that consider various perspectives and aid in their adjustment to parenting a child with DD (Russell, 2003). Some parents adapt flexibly, showing appropriate adjustment in their expectations and actions following diagnosis, while others maintain or develop inappropriate expectations for their parenting roles, especially in the face of denial that there is a problem (Heiman, 2002).

Studies looking at the qualitative experience of parenting children affected by DD have proposed that following the initial diagnosis, parents engage in continual reevaluation of their parenting role by processing through new situations as well as future events in order to reconsider their expectations, plan accordingly, and take on new parenting roles (Russell, 2003; Seideman & Kleine, 1995). Some parents are faced with significant challenges in their parenting roles, especially in the face of poorly coordinated

service delivery systems, leading to a need to become advocates for, rather than merely parents to their children. The increased demands associated with taking on new parenting roles often lead to stressful family dynamics, rigidity and overprotection in parenting, chronic emotional distress, increased social burden and compromised social relationships, decreased feelings of positivity regarding being a parent, and failure to meet their own personal needs and well as needs of other family members (Anthony et al., 2005; Green, 2007; Heiman, 2002; Seideman & Kleine, 1995).

Despite significant challenges associated with caring for a child with DD, research has evidenced that parents often feel the experience of having a child with DD is associated with positive outcomes and benefits including a stronger, better, more competent sense of self, deeper relationships with friends and family, greater appreciation for important things in their lives, greater reward and enrichment in parenting, and overall resiliency in various areas of their lives (Green, 2007; Heiman, 2002; McKeever & Miller, 2004). Moreover, research suggests that parents who show positive cognitive coping factors such as good problem-solving ability and less preoccupation with negative ideation adjust better to their parenting roles, leading to more positive views and realistic expectations of their children (Yau & Li-Tsang, 1999). Additional factors that have been shown to influence satisfaction and adjustment of parental expectations among parents of children with DD include quality of personal resources, a strong marital relationship, characteristics of the child with DD, parental optimism, and strong social support networks (Baker, Blacher, & Olsson, 2005; Yau & Li-Tsang, 1999). A longitudinal study investigating parental adaptation to and satisfaction with parenting children with various disabilities (e.g. Down syndrome, hearing impaired, neurological impairment)

demonstrated relatively high and stable levels of satisfaction with parenting across a three-year period (Hanson & Hanline, 1990). Specific factors implicated in positive parenting experiences and higher parenting satisfaction included lower levels of parenting stress, less restrictiveness in their roles as parents, and a higher sense of competence about their parenting (Hanson & Hanline, 1990). Although parents of children with DD often report positive impact of their child on parenting, it is evident that these parents face differential parenting experiences resulting from the adaptations to parenting expectations that accompany caring for a delayed child.

In addition to having differential parental role expectation and satisfaction, the dyadic parent-child relationship between parents and their children with DD may take on a different form as well. Due to the fact that children with DD experience an increased risk of exhibiting behavior problems, parental behavior management skills and demands are frequently challenged, even in conventional interactions (Crnic, Hoffman, Gaze, & Edelbrock, 2004). Previous research has suggested that over time, the increased parental demands placed on these parents can lead to feelings of ineffectiveness as a parent and increased strain in parent-child relationships, ultimately resulting in coercive dyadic interactions between the parent and child (Anthony et al., 2005; Crnic et al., 2004). Studies have also evidenced that parents of children with DD who regularly characterize their interactions with their children as difficult and lacking pleasure and positivity are particularly susceptible to negative mental health outcomes such as heightened parenting stress (Jackson & Huang, 1998; Östberg & Hagekull, 2000).

An additionally crucial component of the parenting process implicated in caring for a child with DD is parenting behavior. Parents of children with DD often show

increased levels of irritation and decreased levels of tolerance related to their child's functioning and behavior to the extent that they experience decreased self-efficacy and inability to effectively cope with adverse circumstances, such as those presented by disruptive behaviors (Crnic et al., 2005; Hastings, 2002). Such disruptions in parental coping mechanisms and appraisal processes can result in coercive, intrusive, and overall less positive, consistent, and effective parenting behaviors (Blacher, Baker, & Kaladjian, 2013; Crnic et al., 2005; Garner et al., 2013; Hastings, 2002), lending further support to the notion that the parenting process can be significantly impacted by having a child with DD. Furthermore, research has supported the notion that more negative parenting behavior among parents of children with DD can yield higher levels of stress in parents and increased incidence of behavior problems in children (Deater-Deckard & Scarr, 1996; Jackson, 2000), while more positive parenting behavior leads to gains in various domains of development such as play, social, and language skills (Dyches, Smith, Korth, Roper, & Mandeleco, 2012).

Child Development and Behavior Problems among Children with DD

Children affected by DD are at heightened risk for a multitude of negative developmental outcomes. There is substantial empirical evidence that children with DD display clinically significant levels of behavior problems, especially across early childhood or the preschool period (Baker et al., 2003; Baker, Blacher, Crnic, & Edelbrock, 2002; Crnic, Hoffman, Gaze, & Edelbrock, 2004; Emerson & Einfeld, 2010; Merrell & Holland, 1997; Tervo, 2010). Behavior as well as emotional problems among children with DD often manifest at an early age, appearing in children as young as 2

years old and have been evidenced to persist and even worsen over time (Baker et al., 2003; Baker et al., 2002). Research has also demonstrated that relative to typically developing children, the presence of both externalizing and internalizing behavior problems is more prevalent among children with DD (Anthony et al., 2005; Baker et al., 2002; Emerson & Einfeld, 2010; Merrell & Holland, 1997).

Developmentally delayed children also experience significant impairments across a number of core developmental domains including cognitive processes, social skills, motor ability, attention, and communicative deficiencies (Anthony et al., 2005; Tervo, 2010, 2012; Webster et al., 2008). Children with DD often show significant impediments in adaptive functioning and daily living skills such that they require substantially more care and assistance in carrying out daily functions than their typically developing peers. Although 5-8% of all preschool aged children experience some form of communicative deficiency (Wankoff, 2011), speech and language problems are even more pronounced among children with DD and often contribute to compromised peer relationships as well as more problematic peer interactions over time (Guralnick et al., 2006). Regarding social development, children with DD are at heightened risk for poor social competence and social isolation, often display physically and verbally aggressive behaviors, and frequently experience difficulties with prosocial problem solving as well as positive reciprocal interactions with peers (Brown & Conroy, 2011; Fenning, Baker, & Juvonen, 2011; Guralnick, 1999; Merrell & Holland, 1997). In a longitudinal study investigating the peer relationships of young children with mild DD, Guralnick and colleagues (2006) found that both cognitive and language development in children as well as family factors such as stress and support contributed to impaired peer interactions. In terms of

communicative deficiencies, a recent study by Pinborough-Zimmerman et al. (2007) noted that the prevalence of communication disorders was even more elevated among children with various DD related diagnoses such as autism spectrum disorder, attention deficit hyperactivity disorder, intellectual disability, anxiety disorder, and conduct disorder. Moreover, young children with DD frequently experience compromised ability to express wants and needs, interact with others socially, interpret the world around them, and often fail to thrive in school-related contexts as a result of impaired communication (Ronski, Sevcik, Adamson, Smith, & Barker, 2010).

Elevations in behavior and developmental problems among children with DD are of particular concern because these problems are often associated with later development of psychopathology. Studies investigating the prevalence of behavior problems and comorbid psychiatric disorders have yielded co-occurrence rates ranging from 33-67% across children with delays and from 25-54% in typically developing children (Baker, Neece, Fenning, Crnic, & Blacher, 2010; Cormack, Brown, & Hastings, 2000; Dekker & Koot, 2003). It has been evidenced that children with DD who are affected by impairments in communicative ability may also develop significant psychosocial problems and are likely to be referred for psychiatric care (Wankoff, 2011). Additional research centered on children with and without cognitive delays has also demonstrated that delayed children are subject to experiencing higher rates of both behavior and emotional problems (Baker et al., 2010; Neece, Baker, Blacher, & Crnic, 2011; Neece, Baker, Crnic, & Blacher, 2013), pointing to further evidence that behavior problems pose substantial developmental risk for children with delays.

The Interplay between Parental Mental Health and the Parenting Process

Understanding the interplay between parental mental health and the parenting process has increasingly become of pronounced importance to developmental outcomes in children. A host of empirical evidence has delineated the notion that compromised parental mental health, with particular regard to parenting stress, negatively influences the various aspects of the parenting process, which may in turn influence child behavior and development (Anthony et al., 2005; Crnic et al., 2005; Deater-Deckard, 1998; Deater-Deckard & Scarr, 1996; Hastings, 2002; Jackson & Huang, 1998; Östberg & Hagekull, 2000). Collectively, it has been demonstrated that parenting stress has a significant impact on parental role expectation and satisfaction, parenting behavior, and the quality of the parent-child relationship. Inadequacies such as lack of support often result in increased stress and strain on marital and family relationships (Seideman & Kleine, 1995). It is evident that parents of children with DD who experience elevated levels of parenting stress, especially in terms of cumulative stress related to daily hassles, show less positive affect, less dyadic pleasure, warmth, and responsiveness in their parent-child interactions (Crnic et al., 2005), tend to see their children as difficult, generally have expectations for their children that are not developmentally appropriate (Anthony et al., 2005; Creasey & Reese, 1996), and are more likely to exhibit harsh and inconsistent discipline which can ultimately lead to reinforcement of maladaptive behavior (Hastings, 2002).

In addition to providing evidence of changes in parenting behavior and perceptions as a result of stress, it has been noted that stress centered around parent-child relationships may be dependent on greater parental psychological well-being (Crnic et al.,

2005). A plethora of studies have offered support to the notion that maternal depression in particular increases risk for differential parent-child interactions and compromised dyadic relationships (Cooper & Murray, 1998; Grace et al., 2003; Muñoz et al., 2007; Murray, 1992).

The Interplay between the Parenting Process and Child Outcomes

Given the strong evidence that parents of children with DD alter their parenting behavior and are subject to compromised parent-child relationships as a result of heightened parenting stress, it is also important to consider the contribution of these factors to negative developmental outcomes in children. Past research has pointed to the need to investigate the differential influence of both endogenous (e.g. temperament, deficits associated with the delay) and exogenous (e.g. family and parenting processes) factors on child behavior and development (Crnic & Neece, in press; Crnic et al., 2004). It has been well established that exogenous factors such as parenting behavior play a primary role in the development of emotion regulation in children such that these skills are often inherited or socially learned from parents (Cole & Deater-Deckard, 2009; Cole, Michel, & Teti, 1994) and disruptions in this process often result from unresponsive or insensitive parenting (Crnic et al., 2004). Emotion regulation also has important implications for both children affected by DD and their parents. High levels of parenting stress in children with DD may compromise the parent's ability to show effective emotion regulation, which contributes to both frustrated interactions and lack of ability to recognize the child's need for assistance with regulatory capacities (Crnic et al., 2004).

Such disruptions in the parent-child relationship are problematic because they may ultimately lead to subsequent behavior problems in children.

Another aspect of the parenting process that impacts child behavioral and developmental outcomes is parenting behavior. In a 1998 study related to parenting stress and child adjustment, Deater-Deckard proposed a link between poor parenting behavior and child maladjustment. Research in this domain has revealed that negative parenting behaviors (e.g. harsh discipline, rejecting behavior) are related to increased presence of behavior problems and compromised developmental outcomes in children whereas positive parenting behavior (e.g. emotional availability, providing structure and rules) leads to development fostering experiences such as better emotion regulation and less problem behavior (Anthony et al., 2005; Crnic & Neece, in press; Deater-Deckard, 1998; Smith & Prinz, 2001).

Optimizing the Parenting Process: The Role of Mindfulness-Based Stress Reduction

Despite the fact that parenting stress is a substantial problem among parents of children affected by DD and has been consistently linked to poor parental as well as child outcomes, very few interventions aimed at treating child developmental problems actually target parental mental health. Mindfulness-Based Stress Reduction (MBSR) is one particular intervention that has been well-established with over two decades of extensive research as an evidence based stress-reduction practice (Chiesa & Serretti, 2009); however, few studies have examined its effectiveness in reducing stress among parents of children with DD (Baer, Carmody, & Hunsinger, 2012; Evans, Ferrando, Carr, & Haglin, 2011; Neece, 2013). Research centered on MBSR has shown its effectiveness

not only in targeting stress but has also evidenced reductions in anxiety and depression while promoting overall well-being (Chiesa & Serretti, 2009).

A recent study with the current sample was the first randomized controlled trial to examine the feasibility of implementing an MBSR intervention with parents of young children with DD. Preliminary outcomes of the Mindful Awareness for Parenting Stress (MAPS) Project pilot study suggested that this intervention technique could indeed be used with this population and was associated with significant reductions in both parenting stress and child behavior problems (Neece, 2013; Roberts & Neece, 2015). Furthermore, results from a smaller qualitative investigation based on parent responses to a survey administered at the completion of the MAPS pilot study indicated a relationship between improvements in parenting and positive changes in child behavior and development practices following the MBSR intervention (Dennis, Roberts & Neece, 2014). Based on both the qualitative and quantitative outcomes evidenced in the MAPS pilot study, we hope to further explore the interplay among parental mental health, the components of the parenting process, and behavior and development in children affected by developmental delay through a mixed-methods design. Mixed-methodology is generally considered beneficial because the combination of both qualitative and quantitative data provides a more complete understanding of a research question compared to either approach alone (Creswell, 2003). Moreover, in social and behavioral research, mixed-methods designs allow for the dimensions and scope of research to be expanded toward a more comprehensive picture of human experience (Morse, 2003). In the present study, the mixed methodology employed allowed for qualitatively indicated perceived experiences

of parents to be compared with quantitatively measured parent reports of the same constructs.

The Current Study

Although it has been well established that parental mental health influences child behavior and development, the specific mechanisms through which it exerts its impact have yet to be elucidated. Recent studies have pointed to an ever-mounting need to increase understanding of parenting variables such as parental role expectation and satisfaction, the parent-child relationship, and parenting behavior as possible mediators to the relationship between parental mental health and child behavior and development (Anthony et al., 2005; Crnic et al., 2005; Deater-Deckard, 1998; Hastings, 2002). Due to the fact that parenting stress is extremely prevalent among parents of children with DD and can lead to more negative mental health consequences, it has also been suggested that interventions should go beyond simply teaching parenting skills and should instead target methods of reducing parenting stress (Anthony et al., 2005; Crnic & Neece, in press).

Given the interplay between parenting stress, the parenting process, and child outcomes, the aim of the current study was to further examine the mechanisms through which parental mental health, with particular regard to parenting stress, impacts the parenting process and in turn influences behavior and development in children affected by developmental delay. Using a mixed-methods design, we qualitatively assessed how perceived changes in parenting stress influenced behavior and development in children with developmental delay following an MBSR intervention, specifically addressing whether positive changes in parenting led to positive changes in behavior and

development. Based on the qualitative outcomes of the current study, we derived a quantitative model designed to test the relationships under investigation. Quantitatively, we examined measured components of the parenting process including parental role expectation and satisfaction, the parent-child relationship, and parenting behavior as potential mediators of the relationship between parenting stress and child behavior and development at intake. The proposed theoretical model for the interplay between these variables is presented in Figure 1.

The movement toward mixed-methods designs in social and behavioral research has not only allowed for the shortcomings of each individual approach to be addressed, but has contributed to increased integration of information from varying data sources (Barbour, 1999; Lund, 2012). Several advantages to combining qualitative and quantitative approaches have been noted including: (1) the ability to answer more complex research questions related to both causal description and causal explanation in intervention research, (2) providing a more complete picture of the domain under investigation, (3) allowing more valid inferences to be made, and (4) generating more in-depth reflection, revised hypotheses, further research, and new theoretical insights (Lund, 2012). Utilizing mixed-methodology in the present study will ultimately increase and advance the scope and understanding of the interplay between parenting stress, the parenting process, and child outcomes.

CHAPTER TWO

METHOD

Participants

The current study employed data from the MAPS Project at Loma Linda University, which included 2 cohorts of parents and their children 2.5 to 5 years old with DD. Phase 1 was conducted in 2012 and included 46 parents and their children. Phase 2 was initiated in 2013 and included 45 parents and their children. Families who participated in the MAPS Project were primarily recruited through Inland Regional Center in Southern California, a government agency that provides services to individuals with disabilities. Additional participants were recruited through local elementary schools, the local newspaper, and community-based disability groups. Families who met study criteria were identified from IRC's computerized databases and were sent a letter and brochure detailing the study. Interested parents either contacted the MAPS Project by phone, returned a postcard requesting us to contact them, or submitted their contact information on the MAPS website.

Inclusion criteria for participation in the study were: (1) having a child 2.5 to 5 years old, (2) the child was determined to have a developmental delay by Inland Regional Center or an independent assessment, (3) parent(s) reported more than 10 child behavior problems (the recommended cutoff score for screening children for treatment of conduct problems) on the Eyberg Child Behavior Inventory (ECBI; Robinson, Eyberg, & Ross, 1978), (4) the parent was not receiving any form of psychological or behavioral treatment at the time of referral (e.g. counseling, parent training, parent support group, etc.), and (5) the parent agreed to participate in the intervention. For Phase 1 of the study, parent ability

to speak and understand English was also an inclusionary criterion due to limitations in study resources; however, for Phase 2, monolingual Spanish speaking families were eligible for participation. Exclusion criteria included parents of children with debilitating physical disabilities or severe intellectual impairments that prevented the child from participating in a parent-child interaction task that was a part of the larger laboratory assessment protocol (e.g. child is not ambulatory).

In order to be included, parents must also have completed all initial measures and attended the initial assessment before the beginning of the first intervention session. Of the 95 families that were screened for the first phase of the study, 63 were determined to be eligible, and 51 parents enrolled in the study originally. Five parents completed the initial assessments but dropped out of the study before the intervention began leaving a total of 46 parents in the larger pilot study sample (Neece, 2013). For the second phase of the study, 97 families were screened, 80 were determined to be eligible, and 79 parents enrolled in the study. Fifteen parents completed the initial assessment but dropped out of the study before intervention began, leaving a total of 64 in the Phase 2 study sample, and a combined sample of 110. The demographic characteristics of the participants in the combined MAPS sample are presented in Table 1. There were no demographic differences between participants who completed the intervention and those who dropped out of the study. The final sample utilized in the current analyses was determined by the number of parents who had complete data on all relevant measures of interest, resulting in a total of 96 parent-child pairs. Participants were excluded from the analyses if they were missing data on any of the relevant measures utilized in the quantitative analyses.

Procedure

Parents interested in participating in the study contacted the MAPS project by phone, postcard, or submitting their information on the project website. Study personnel then conducted a phone screen to determine the eligibility of the parent(s). If the parent(s) met inclusion criteria, an intake laboratory assessment with the parent(s) and child was scheduled. Prior to the initial assessment, parents were mailed a packet of questionnaires that were to be completed before arrival at the assessment.

The initial assessment took place in the MAPS laboratory in the Department of Psychology at Loma Linda University. At this assessment, parents were given an informed consent form that was reviewed by study personnel. After completing the informed consent and an interview to collect demographic information, the parents drew a piece of paper out of a box which informed them of whether they were in the immediate treatment or wait-list control intervention group. Parents assigned to the immediate treatment group began intervention in March 2012 and parents assigned to the control group began the intervention in June 2012.

The Mindfulness Based Stress Reduction (MBSR) intervention followed the manual outlined by Dr. Jon Kabat-Zinn at the University of Massachusetts Medical Center (Kabat-Zinn et al., 1992). This intervention consisted of three main components: (1) didactical material covering the concept of mindfulness, the psychology and physiology of stress and anxiety, and ways in which mindfulness can be implemented in everyday life to facilitate more adaptive responses to challenges and distress, (2) mindfulness exercises during the group meetings and as homework between sessions, and (3) discussion and sharing in pairs and in the larger group. The MBSR program included

eight weekly 2-hour sessions, a daylong 6-hour meditation retreat after class 6, and daily home practice based on audio CDs with instruction. Formal mindfulness exercises included the body scan, sitting meditation with awareness of breath, and mindful movement. The instructor for the group had over 20 years experience practicing mindfulness and teaching MBSR, completed the Advanced MBSR Teacher Training at the University of Massachusetts Medical Center, and had received supervision with Senior MBSR Teachers through the Center for Mindfulness at the University of Massachusetts Medical Center.

After the immediate treatment group completed the intervention, parents participated in a post-treatment assessment and completed the measures again. At the same time, the parent assigned to the delayed treatment group also returned to the laboratory to participate in the same assessment in order to execute the waitlist-control design. Each group also returned at their respective six-month follow-up time points to complete a modified laboratory assessment and packet of questionnaires. After the completion of the project (all assessments were conducted) parents received a short summary of their child's behavioral functioning in order to reinforce parents' efforts to improve their parenting skills as well as raise awareness of remaining concerns.

Measures

Demographic Variables

Demographic information was collected during an interview with the participating parent and will be analyzed accordingly based on the final sample included in our analyses.

Table 1. Demographic Characteristics of Participants from Phase 1 and Phase 2 of the MAPS Study

	<i>n</i> = 96
Children	
Gender (% boys)	70.90
Mean age in years (<i>SD</i>)	4.27 (1.41)
Ethnicity (% Caucasian)	27.30
Participating Parent	
Mean age in years (<i>SD</i>)	36.42 (7.60)
Marital Status (% married)	68.20
Mean grade in school (<i>SD</i>)	14.37 (2.89)
Family Income (% > \$50k)	40.60

Qualitative Questionnaire

A qualitative questionnaire with open-ended items was administered to parents participating in the MBSR group at various time points. We used the question responses from the final evaluation questionnaire completed at the conclusion of the eight-week MBSR course. Of the total 11 questions on the questionnaire, parent responses to three questions specifically asking about changes in stress levels, changes in parenting, and changes in child behavior and development were used to inform our analyses.

Specifically these questions include: (1) What changes, if any, have you noticed in your stress levels?, (2) What changes, if any, have you noticed in your parenting?, and (3) What changes, if any, have you noticed in your child's development and/or behavior while you have been in the group?

Parenting Stress Index – Short Form (PSI- SF, Abidin, 1995)

The PSI was used to assess parenting stress. The PSI-SF contains 36 items that

are rated on a 5-point Likert scale ranging from “Strongly Agree” (1) to “Strongly Disagree” (5) and contains three subscales, Parental Distress, Parent-Child Dysfunctional Interaction, and Difficult Child, which are combined into a Total Stress score (Abidin, 1995). The PSI also includes a validity index, which measures the extent to which the parent is answering in a way that he or she thinks will make them look best. A score of 10 or less on this index suggests that the reporter is responding in a defensive manner and indicates that caution should be used in interpreting any of the scores. Any participants who have a defensive responding score less than 10 at the pre-treatment assessment will be removed from the present analyses.

In terms of the individual subscales, we plan to use the Parental Distress subscale, which measures the extent to which the parent is experiencing stress in his or her role as a parent. This subscale will be utilized because it assesses parental stress independent of child behavior problems, which is also a key outcome variable of the current investigation. The reliability for the Parental Distress subscale in our sample was high ($\alpha = .89$).

Parenting Satisfaction Scale (PSS, Guidubaldi & Cleminshaw, 1994)

The PSS is a 45-item scale designed to measure attitudes toward parenting and identify troubled parent-child relationships. The PSS assesses satisfaction in three domains including satisfaction with the parenting of the child’s other parent, satisfaction with their own parenting performance, and satisfaction with their own relationship with the child. Parents are asked to respond to item on a 4-point Likert Scale ranging from “Strongly Agree” (1) to “Strongly Disagree” (4). In the present study, the Parent-Child

Relationship subscale was used to inform parental role expectation and satisfaction. The PSS has been established as a reliable and valid measure and the internal consistency for the Parent-Child Relationship subscale in the current study was relatively low ($\alpha = .53$). The mean score at pre-treatment was 83.61, which translates to a standard score of 43 (26th percentile).

Parenting Relationship Questionnaire (PRQ, Kamphaus & Reynolds, 2006)

The Parenting Relationship Questionnaire is a 45-item scale designed to assess the relationship between the primary caregiver and his or her child. The scale measures this construct through five subscales, two of which were of primary interest for the current study to inform the parent-child relationship component of the parenting process. The Parenting Confidence subscale measures level of parent comfort, control, and confidence with parenting, and the Relational Frustration subscale was measures of the parent's level of stress in relating to or controlling the behavior and affect of child, along with the tendency to be overreactive and frustrated in parenting situations. Parents responded to the questions on the PRQ on a 4-point Likert scale ranging from "Never" (1) to "Almost Always" (4). Cronbach's alpha coefficients for the Parenting Confidence ($\alpha = .71$) and Relational Frustration ($\alpha = .80$) subscales in the current sample were moderately high.

Parenting Practices Interview (PPI, Webster-Stratton 2001)

The PPI was designed to measure parenting skills or discipline styles of parents of young children. The PPI consists of 15 questions, each with several aspects, asking for a

response of the parent to misbehavior, appropriate behavior, and several related statements. Parents are asked to respond to these questions and respond on a 7-point Likert-scale, ranging from “Never/Not at all likely/Strongly Disagree” (1) to “Always/Extremely Likely/Strongly Agree” (7). The PPI is composed of seven subscales, three of which were of interest for the present study to inform parenting behavior and practices including: Harsh Discipline, Appropriate Discipline, and Positive Parenting. Cronbach’s alpha coefficients for the Harsh Discipline ($\alpha = .84$) and Appropriate Discipline ($\alpha = .89$), scales were high; however, it was relatively low for the Positive Parenting subscale ($\alpha = .55$).

Child Behavior Checklist for Ages 1.5 - 5 (CBCL, Achenbach, 2000)

The CBCL 1.5 to 5 was used to assess child behavior problems. The CBCL contains 99 items that are rated as “not true” (0), “somewhat or sometimes true” (1), or “very true or often true” (2). Each item represents a problem behavior, such as “acts too young for age” and “cries a lot.” The CBCL yields a total problem score, 2 broad-band externalizing and internalizing scores, 7 narrow-band scales, and 6 DSM-oriented scales; however, the current study will analyze the individual items through the “Total Problems” score. The mean reliability for the total problem score for our sample was high ($\alpha = .93$) and previous research indicates that this instrument has strong convergent validity (Achenbach, 2000).

Social Skills Improvement System (SSIS, Gresham & Elliott, 2008)

The SSIS was used as an indicator of social development in children and was

administered to the child's mother via self-report. The SSIS is a widely used questionnaire that has adequate reliability and validity and provides a broad assessment of social skills, problem behaviors and academic competence for children. The present study used the 38-item Social Skills Scaled Score, comprised of seven sub-scales including Communication, Cooperation, Self-Control, Responsibility, Empathy, Engagement, and Assertion. Internal consistency for the current sample was high ($\alpha = .97$).

Data Analytic Plan

The aim of the current study was to further examine the mechanisms through which parental mental health, with particular regard to parenting stress, impacts the parenting process and in turn influences behavior and development in children affected by developmental delay. In order to evaluate the relationships of interest, we employed a mixed methods design. Our primary hypothesis for the qualitative outcomes was that parents would report positive changes across the three domains of interest following the MBSR intervention (e.g. reductions in parenting stress, positive changes in parenting, and positive changes in child behavior and developmental outcomes.) In terms of quantitative outcomes, we hypothesized that the components of the parenting process (e.g. parental role expectation and satisfaction, the parent-child relationship, and parenting behavior) would mediate the relationship between parenting stress and child behavioral and developmental outcomes. Outcomes from a smaller qualitative project specifically addressing whether positive changes in parenting led to positive changes in behavior and development following the completion of the MAPS pilot study (Dennis, Roberts, &

Neece, 2014) were utilized and expanded upon in the present study. Accordingly, the qualitative outcomes reported are based on data only from Phase 1 of the MAPS project. These pilot outcomes provided the rationale for further investigation of the impact of parenting stress on parental role expectation and satisfaction, parenting behavior, and the parent-child relationship on subsequent child behavior and development through the proposed quantitative model. For the purposes of the current study, quantitative relationships in the mediation models were only examined at the intake time point to first test if the proposed variables of interest were indeed related in the MAPS combined sample.

Qualitative Data

Parent responses to qualitative questionnaires were transcribed from the questionnaire verbatim. Questions pertaining to changes in stress at the completion of the study, changes they noticed regarding their parenting practice and ability, and observed changes in their child's behavior and/or development were of primary focus. Responses were then systematically coded by two individuals using a directed approach to content analysis. According to this method of qualitative data analysis, the coders first identified key concepts in the parent responses to qualitative questions to be used as initial coding categories. The coders then operationally defined each of the key concepts according to theory and prior research, to capture prevalent issues outlined by previous research in regard to parental mental health, parenting related expectations, satisfaction, and behavior, and child behavior and development among populations affected by developmental delay (Hsieh & Shannon, 2005). In the present study, responses to open

ended questions about changes in stress levels, parenting, and child behavior/development were used to create a framework that allowed the coders to explore and identify the perceived benefits of an MBSR intervention across these three domains. Following the directed content analysis methodology, each coder independently read through the parent responses in detail, multiple times, in order to gain an understanding of responses that represented changes in stress levels and mental health, parenting, and child behavior/development (Hsieh & Shannon, 2005). The coders then noted initial impressions and objective themes that fit within the framework of the three domains of change (Hsieh & Shannon, 2005). The coders subsequently compared outcomes and discussed both agreements and inconsistencies in their ratings. Inter-coder reliability was determined by the level of agreement between the two coders on initial impressions and themes in the parent responses that were representative of the key concepts outlined. Ultimately, the results of the qualitative analysis were used to drive the quantitative model being investigated in the current study; examining how perceived changes in parenting stress and parenting practices related to perceived changes in behavior and development among the children. Qualitative analysis outcomes were also compared with quantitative outcomes to evaluate the degree to which what parents reported quantitatively actually matched what they said qualitatively.

Quantitative Data

Demographic characteristics of the sample were assessed using standard descriptive statistic frequency analyses. Given that we proposed the three specific components of the parenting process will have a mediating effect on the relationship

between parenting stress and child behavior and development, we employed a statistical technique known as multiple mediation. Multiple mediation is currently the most appropriate mediation analysis method for testing the relationship between a predictor variable and outcome variable when the model consists of more than one mediating variable (Preacher & Hayes, 2008a). A series of multiple mediation analyses using the bootstrapping method were conducted for Phase 1 and Phase 2 combined in order to determine whether the three components of the parenting process mediate the relationship between parenting stress and child outcomes while maximizing statistical power. These analyses were conducted using “Indirect,” a multiple mediation macro developed by Preacher and Hayes (2008a) for SPSS. The bootstrapping method takes a sample of size n with replacement from the original sample in order to calculate the indirect (mediation) effect and the program repeats this process 5000 times. This procedure provides the total indirect effect, specific indirect effects for each mediating variable, and tests of all pairwise comparisons among specific indirect effects, providing both standard errors and 95% confidence intervals (CIs). Results are reported and interpreted with respect to bias-corrected and accelerated (BCa) bootstrap CIs, because they are generally considered to be most accurate (Briggs, 2006; Preacher & Hayes, 2008; Williams & MacKinnon, 2008).

CHAPTER THREE

RESULTS

Qualitative Data

In order to qualitatively assess changes in stress, parenting practices and ability, and child behavior and development at the completion of Phase I of the study, a directed content analysis of parent responses to questions pertaining to changes in stress, parenting, and child behavior/development was conducted. Results indicated a variety of positive changes in all three domains as noted by parents following the MBSR intervention.

Parenting Stress

Parents were asked to report any changes they noticed in their stress levels. The majority of parents reported overall reductions in their stress levels, with some indicating significant decreases, as noted by a mother of a young girl newly diagnosed with autism:

“Tons have changed. I’m appreciating what life has to offer. Making life changes to reduce the stress that I know and that I have control over. I use to stress and not know it. Now I know and pin point why I stressing and try and change it. Now my stress is much less.”

A subset of parents reported having more awareness of when stress occurs as well as having more control over it and being better able to manage it successfully. Although some parents reported little to no change in their actual stress levels, there seemed to be a general consensus among parents that they were more capable of handling stress despite the fact that the stressors themselves did not necessarily change. This can be seen in the following quote from a mother of a five-year-old boy with autism:

“I still have the same amount of stress but feel I handle them better. And my stress levels are lower- although I am still working on this.”

In addition, parents noted changes in how they reacted to stress, highlighting improvements in their mood (e.g. reductions in anxiety, anger, fear). A proportion of parents also pointed to the importance of the mindfulness practices in managing their stress levels, which was reflected in this mother’s quote:

“I have notice that, I can stay more alert to what I’m doing. I’m able to stay more clam when a stressful situation comes.”

Parenting Practices and Ability

Parents also were asked to report any changes they noticed in regard to their parenting practice and ability. Every parent reported at least some level of positive change with the majority of parents pointing out a multitude of improvements. The most commonly reported changes were increases in parent levels of patience and appreciation for their children, as evidenced by the following statement made by the mother of a two-year-old girl with autism:

“I have patience much more. I’m more confident about my parenting skills instead of second guessing all the time. I’m not seeking approval I’m allowing myself acceptance and know I’m trying my very best.”

Some parents reported feeling more confident in their parenting ability and said they were better able to parent their children effectively. Various parents reported greater enjoyment of time they spend with their children and noted that they actually spent more time together. As expected, many changes related to mindful awareness were reported in regard to parenting. After completing the intervention, parents reported being more present, less impulsive, and noted they were better able to look at the “big picture” with

some parents noting positive changes specific to perspective taking, awareness and acceptance. One mother noted:

“I am not letting every little thing get to me. [I’m] focusing more on what [my son] can do and accomplish each day. I don’t yell as much, actually hardly at all now.”

Child Behavior and Development

Parents were additionally asked to report any observed changes in their child’s behavior and/or development. Responses indicated a plethora of changes in both domains. Regarding behavior, multiple parents reported positive changes in temperament and emotion stating that their children seemed to display both happier moods and calmer dispositions. In terms of development, various improvements were noted. Some parents pointed out that their children had success with potty training following the intervention, which had not been achieved previously. One single mother of a three-year-old girl with speech delay stated:

“I have noticed that my daughter has been talking a lot more. She’s potty trained and become more independent.”

The most prevalent change in development indicated by the parent interviews appeared to be in communicative ability. The majority of parents reported one or more positive changes in their child’s speech and language development, with a few pointing to a greater desire for social interaction and improved parent-child relationships. The following statements were made by the mother of a three-year-old girl with autism and the father of a four-year-old boy with autism, respectively:

“My child, as severe as she is, has made progress for the first time. I can express my feelings to her better, and we are both enjoying ourselves.”

“My son is making enormous progress in terms of speech and language development.”

Overall, the qualitative outcomes indicate that parents experienced significant improvements across their levels of parenting stress, parenting practice and ability, and child behavior and development. In comparing parent responses across the three domains, parents who noted positive changes in one area also tended to note positive changes in at least one, if not both other areas. For example, the majority of parents who indicated improvements in their parenting practice and ability tended to note positive changes in their child’s behavior and development as well, pointing to an overarching theme of positive improvement and change following the MBSR intervention.

Quantitative Data

In order to quantitatively evaluate the theoretical model derived from the qualitative outcomes (Figure 1), several mediation analyses were conducted at intake. Outcomes of the directed content analysis were utilized in choosing quantitative measures that aligned with parenting stress, the components of the parenting process, and child behavior and development accordingly. The subscales used as indicators in the mediation models were chosen on the basis of: 1) the alignment of parents’ qualitative responses with the construct assessed by the measure or the subscales within the measure, 2) how well the actual content of the items comprising each subscale mapped on to parents’ responses, and 3) the overall reliability and validity of the measure (see Table 2).

Table 2. Correspondence between Qualitative Outcomes and Measure Subscales Chosen as Quantitative Indicators

Qualitative Category	Qualitative Outcome(s)	Conceptualized Construct/ Variable	Quantitative Measure Chosen as Indicator
1) Stress Levels	Overall reductions in stress levels	Parenting Stress	PSI- Parental Distress subscale
2) Parenting Practices and Ability	Greater enjoyment/ appreciation for children	Parental Role Expectation and Satisfaction	PSS- Parent-Child Relationship subscale
	Increased parenting confidence/ patience	Parent-Child Relationship	PRQ- Parenting Confidence and Relational Frustration subscales
	Increased parenting effectiveness	Parenting Behavior	PPI- Positive Parenting, Appropriate Discipline, and Harsh Discipline subscales
3) Child Behavior and Development	Calmer dispositions/ less behavior problems	Child Behavior	CBCL- Total Problems Score
	Improved communicative ability/ greater desire for social interaction	Child Development	SSIS- Social Skills Scaled Score

Note. PSI = Parenting Stress Index; PSS = Parenting Satisfaction Scale; PRQ = Parenting Relationship Questionnaire; PPI = Parenting Practices Interview; CBCL = Child Behavior Checklist; SSIS = Social Skills Improvement System.

Based on the outcomes of the directed content analysis, the Parental Distress subscale of the PSI was chosen as an indicator of parenting stress independent of child behavior problems. In terms of mediating variables, the Parent-Child Relationship subscale of the PSS was chosen as an indicator of parental role expectation and

satisfaction due to parents' reference to greater enjoyment and appreciation for their children, the Parenting Confidence and Relational Frustration subscales of the PRQ were chosen as indicators of the parent-child relationship given parents' reference to increased parenting confidence and patience, and the Positive Parenting, Appropriate Discipline, and Harsh Discipline subscales of the PPI were chosen as indicators of parenting practices and behaviors based on parent reports of increased parenting effectiveness. Regarding outcome variables, the Total Problems score of the CBCL was chosen as a measure of child behavior according to parent's reports of their children displaying calmer dispositions and less behavior problems, and the Social Skills Scaled Score of the SSIS was chosen as a measure of child development based on parent responses indicating both improved communicative ability and greater desire for social interaction.

A series of multiple mediation analyses using the bootstrapping method were conducted to test whether the proposed components of the parenting process mediate the relationship between parenting stress and child behavior and development. Given that only one subscale of the PSS was utilized, two single mediation analyses were conducted for each of the outcome variables. The results of the mediation analyses for each outcome variable are presented in Tables 3 and 4.

Parental Role Expectation and Satisfaction

Results of a single mediation analysis testing whether parent-child relationship satisfaction mediated the relationship between parenting stress and child behavior problems indicated a non-significant mediation effect ($p > .05$; see Table 3). Similarly,

parent-child relationship satisfaction did not significantly mediate the relationship between parenting stress and child social skills ($p > .05$; see Table 4).

Table 3. Results of Mediation Analyses Testing the Components of the Parenting Process as Mediators of the Relationship Between Parental Distress and Child Behavior Problems

Independent Variable	Mediated Effect	Point Estimate	SE	BCa 95% CI
Parental Distress	<i>Single Mediation Analysis</i>			
	Parental Role Expectation and Satisfaction (PSS)			
	Parent-Child Relationship	-.001	.032	[-.060, .057]
	<i>Multiple Mediation Analyses</i>			
	The Parent-Child Relationship (PRQ)			
	Parenting Confidence	-.019	.041	[-.136, .036]
	Relational Frustration	.212*	.119	[-.047, .541]
	Total Indirect Effect	.193	.113	[-.032, .511]
	Parenting Confidence vs. Relational Frustration	-.230*	.138	[-.602, -.037]
	Parenting Behaviors (PPI)			
	Positive Parenting	.009	.029	[-.031, .098]
	Appropriate Discipline	-.019	.038	[-.132, .018]
	Harsh Discipline	-.006	.027	[-.104, .026]
	Total Indirect Effect	-.017	.056	[-.142, .090]
	Positive Parenting vs. Appropriate Discipline	.028	.048	[-.051, .138]
	Positive Parenting vs. Harsh Discipline	.015	.038	[-.041, .126]
	Appropriate Discipline vs. Harsh Discipline	-.013	.045	[-.109, .057]

Note. BCa 95% CI = 95% bias-corrected and accelerated confidence interval.

*Significant mediation effect or pairwise comparison.

The Parent-Child Relationship

Results of a multiple mediation analysis indicated that relationship frustration significantly mediated the relationship between parenting stress and child behavior

problems (see Figure 2). Specifically, as parenting stress increased by one-point on the Parental Distress subscale of the PSI, child behavior problems increased on the Total Problems scale of the CBCL by .212 points, via the effect of relational frustration, BCa 95% CI [.047, .541]. Parenting confidence on the other hand did not significantly mediate the relationship between parenting stress and child behavior problems ($p > .05$); however, a pairwise comparison of the specific indirect effects showed that the relative strengths of the two mediators were significantly different from each other, with relationship frustration better predicting child behavior problems, ($ab = -.230$, BCa 95% CI [-.602, -.037]; see Table 3).

Given that relationship frustration was a significant mediator to the relationship between parenting stress and child behavior problems at baseline, a post-hoc analysis was conducted to examine these effects longitudinally at post-treatment. Due to multiple mediation's inability to examine change over time using a longitudinal model, two hierarchical multiple linear regressions were conducted. Results indicated that parenting stress significantly predicted relational frustration at post-treatment above and beyond baseline levels of these variables ($t = 3.810$, 95% CI [.085, .272], $\beta = .430$, $p < .001$). Specifically, every 1-point increase in parenting stress was associated with a .179-point increase in relational frustration. Additionally, relationship frustration significantly predicted child behavior problems at post-treatment above and beyond baseline levels of these variables ($t = 2.464$, 95% CI [.321, 3.038], $\beta = .226$, $p < .05$). Specifically, for every 1-point increase in relationship frustration, there is a 1.680-point increase in behavior problems. Proportions of variance explained by each regression model were 29.1% and 47.2%, respectively.

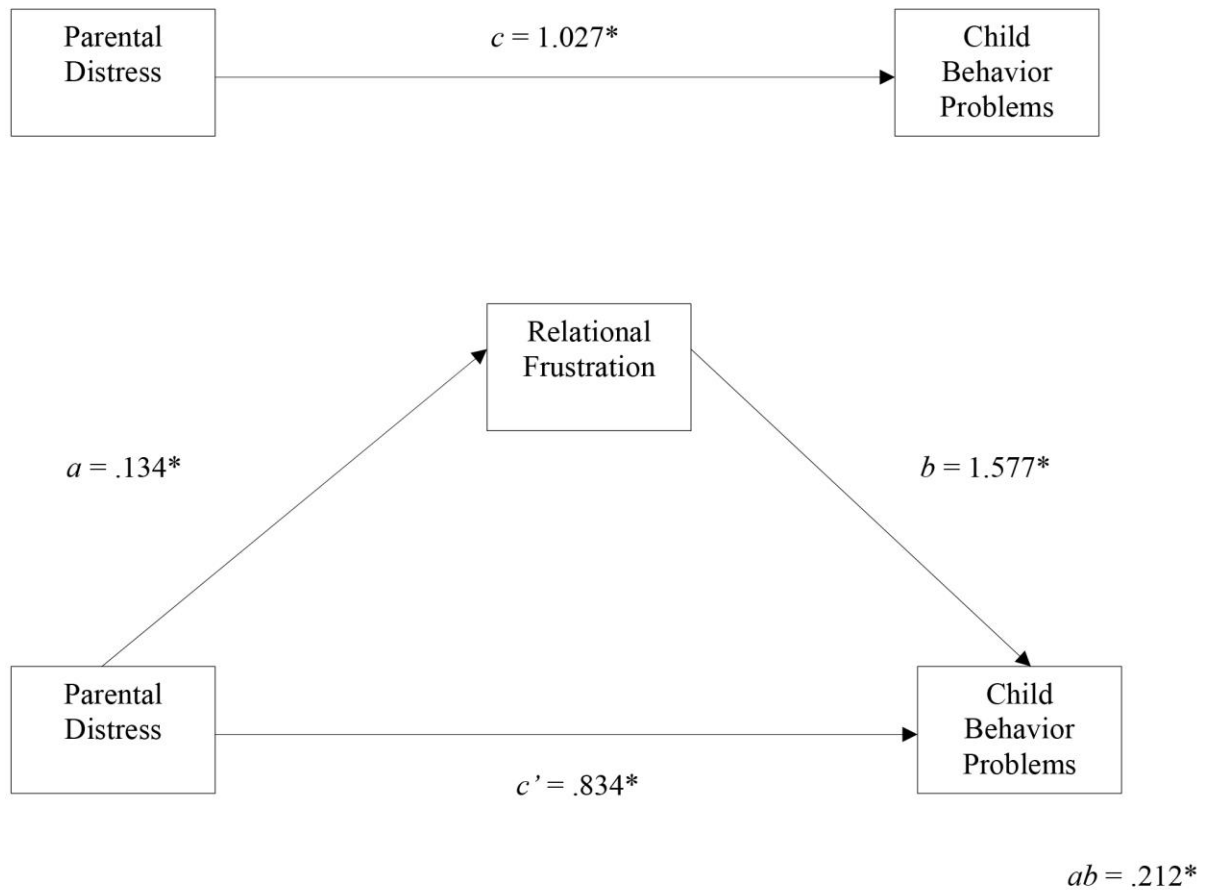


Figure 2. Mediation model predicting child behavior problems from parental distress through the effect of parent-child relational frustration. *Significant path.

Results of a multiple mediation testing child social skills development as an outcome showed that neither relationship frustration nor parenting confidence significantly mediated the relationship between parenting stress and child social skills (p 's $> .05$; see Table 4). Additionally, the pairwise comparison between the mediating variables was not significant ($p > .05$).

Table 4. Results of Mediation Analyses Testing the Components of the Parenting Process as Mediators of the Relationship Between Parental Distress and Child Social Skills Development

Independent Variable	Mediated Effect	Point Estimate	SE	BCa 95% CI
Parental Distress	<i>Single Mediation Analysis</i>			
	Parental Role Expectation and Satisfaction (PSS)			
	Parent-Child Relationship	-.008	.028	[-.123, .009]
	<i>Multiple Mediation Analyses</i>			
	The Parent-Child Relationship (PRQ)			
	Parenting Confidence	-.035	.041	[-.147, .019]
	Relational Frustration	.069	.067	[-.039, .214]
	Total Indirect Effect	.033	.065	[-.096, .162]
	Parenting Confidence vs. Relational Frustration	-.104	.090	[-.312, .027]
	Parenting Behaviors (PPI)			
	Positive Parenting	-.001	.014	[-.037, .025]
	Appropriate Discipline	-.043	.050	[-.163, .019]
	Harsh Discipline	.003	.016	[-.015, .058]
	Total Indirect Effect	-.041	.052	[-.156, .042]
	Positive Parenting vs. Appropriate Discipline	.042	.051	[-.026, .159]
	Positive Parenting vs. Harsh Discipline	-.004	.021	[-.061, .030]
	Appropriate Discipline vs. Harsh Discipline	-.046	.054	[-.181, .021]

Note. BCa 95% CI = 95% bias-corrected and accelerated confidence interval.

*Significant mediation effect or pairwise comparison.

Parenting Behavior and Practices

Results of a multiple mediation analysis testing whether parenting practices and behavior mediated the relationship between parenting stress and child behavior problems indicated that positive parenting, harsh discipline, and appropriate discipline were not significant mediators in this relationship (p 's > .05; see Table 3). Furthermore, there were no significant pairwise comparisons between the mediators (p 's > .05).

In terms of social skill development as an outcome, positive parenting, harsh discipline, and appropriate discipline did not significantly mediate the relationship between parenting stress and child social skills (p 's > .05; see Table 4). Additionally, there were no significant pairwise comparisons between the mediating variables (p 's > .05).

CHAPTER FOUR

DISCUSSION

Given the interplay between parenting stress, the parenting process, and child outcomes, the aim of the current study was to further examine the mechanisms through which parental mental health, with particular regard to parenting stress, impacts the parenting process and in turn influences behavior and development in children affected by developmental delay. Using a mixed-methods design, we assessed how both perceived and measured changes in parenting influence behavior and development in children with developmental delay. Qualitatively, we examined parent reports of changes in stress levels, parenting practice and ability, and child behavior and development. It was hypothesized that the various factors involved in parenting practice and ability may be potential mechanisms through which parenting stress impacts child behavior and development. Thus, the qualitative outcomes were used to derive a quantitative model that assessed whether parental role expectation and satisfaction, the parent-child relationship, and parenting behavior and practices mediated the relationship between parenting stress and child behavior and development.

Results of the qualitative directed content analysis indicated that parents perceived significant improvements across their levels of parenting stress, parenting practice and ability, and child behavior and development following the MBSR intervention. It appears that the MBSR intervention proved effective in reducing the stress they experience as parents of children with DD, even if the stressors they were experiencing did not necessarily change. Although previous studies with this sample support significant reductions in parenting stress via quantitative measures (Neece, 2014;

Roberts & Neece, 2015), the findings noted here are important to consider in the context of parent perceptions of stress. Due to the fact that the stressors experienced by these parents did not change or dissipate as a function of the intervention, and in some cases actually increased while participating in the MAPS project, it appears that perceptions of stress and ability to cope with stress may be an equally important consideration in the context of MBSR benefits.

Regarding changes in parenting practice and ability, the majority of parents felt that their parenting improved as a result of the intervention, thereby leading to more positive interactions with their children via reported increases in various parent factors including patience, appreciation and enjoyment of time spent with their children, and facets of mindfulness. Specific facets of mindfulness were originally considered as potential mediators in the model derived from qualitative outcomes; however, parent reports in this regard were seen as more of a function of participation in a mindfulness intervention rather than a true reflection of mindful parenting practices. Additionally, because mediation effects were only tested at baseline, it is unlikely that mindful parenting would have been evident prior to completion of the intervention. Despite the fact that the facets of mindfulness were not tested quantitatively, it appears that they may play a role in improving parental perceptions of their ability to interact with and parent their children in an effective manner. Mindfulness training may also create an increased sense of confidence related to parenting and improved perceptions of parent-child relationships via reductions in impulsiveness, increases in parental ability to focus on the present, and acceptance of both their own parenting skills and the challenges associated with caring for a child with DD.

In terms of child behavior and development, qualitative outcomes indicated that parents perceived changes across the domains of temperament, emotion, and communicative ability. It is noteworthy that reductions in child behavior problems and increases in child social skill development have been evidenced in quantitative studies with the MAPS sample as well. Neece (2014) found decreases in child behavior problems at post-treatment and Lewallen and Neece (2015) provided support for improved social skills in various domains. It appears that developmental and behavioral gains are prominent areas of perceived and reported improvement for children with DD following the intervention. Thus, MBSR seems to play a role not only in improving parental mental health, but may also have additional benefits for child outcomes both in terms of parent perceptions of child functioning as well as actual developmental status.

Overall, responses to qualitative questions indicated a relationship between improvements in parenting stress, parenting practice and ability, and positive changes in child behavior and development as a result of participation in the MAPS program. Taken together, the qualitative findings noted suggest that MBSR interventions may prove effective for parents of children with DD in terms of their perceptions and experiences of parenting stress, the processes they engage in when parenting their children, and their children's behavior and development.

Quantitative results testing the proposed components of the parenting process as potential mechanisms through which parenting stress influences child behavior and development were mixed. Contrary to our expectations, parent-child relationship satisfaction, parenting confidence, positive parenting, appropriate discipline, and harsh discipline were not identified as mechanisms through which parenting stress impacts

child behavior and development. Although this is first study to investigate mechanisms in regard to the parenting process, it is worth noting that our findings are somewhat inconsistent with previous research examining these processes as either predictors or outcomes. For example, greater levels of positive parenting and parenting satisfaction specifically have been evidenced when parenting stress is low and parenting competence is high among parents of children with DD (Hanson & Hanline, 1990). Research has also evidenced that having a child with DD can be an overall positive, rewarding experience (Blacher & Baker, 2007), sometimes leading to levels of satisfaction that extend above and beyond parenting a typically developing child (Green, 2007; Heiman, 2002; McKeever & Miller, 2004). Regarding parenting behavior and related discipline practices, studies have evidenced that negative parenting behaviors such as harsh discipline are often predictive of maladaptive behavior and compromised developmental outcomes in children whereas positive parenting behavior can foster appropriate behavior and development (Anthony et al., 2005; Crnic & Neece, in press; Deater-Deckard, 1998; Smith & Prinz, 2001). Although direct effects were not examined for the purposes of the current study, they may be worth considering to determine whether these processes occur in the same manner in the present sample.

These inconsistencies in our quantitative findings may be attributable to various factors. First, it may be the case that parents in our sample started out with high baseline levels of parental role expectation and satisfaction, and since this mediation effect was only tested at baseline in the quantitative model, our findings failed to capture the true nature of the relationship between parent-child relationship satisfaction, parenting stress, and child outcomes as a function of the mindfulness intervention. Second, it is possible

that the quantitative measure subscales selected as indicators of the constructs of interest did not accurately or fully capture or represent parent perceptions of the domains in which they reported changes following the intervention. It is worth noting that the measure subscales we used to capture both satisfaction and positive parenting had relatively low reliability in the current sample, which could have impacted the results. We examined reliability coefficients for those measures with low reliability to see if reliability could be improved by deleting items; however, coefficients showed little to no improvement. Furthermore, it could be the case that the three specific components of the parenting process under evaluation may not accurately fit the predicted relationship. There very well could be more than three components to the parenting process or differential components that have yet to be elucidated. Positive changes to the parenting process in and of themselves may not necessarily be beneficial enough to reduce parenting stress and subsequently, maximize child outcomes. Finally, it is plausible that there is an inherent discrepancy between parent perceptions of changes and measured changes across the domains assessed in the present study. Parents may be particularly susceptible and sensitive to recognizing changes on a broader level more reflective of reality as opposed to reporting changes via standardized measurement scale items. It appears that regardless of what is reported by parents via self-report measures, they perceive immense changes both in themselves and their children, highlighting the imperative role perceived experiences can play in response to intervention.

On the other hand, parent-child relational frustration was found to be a mechanism through which parenting stress impacts child behavior problems in the current sample, such that higher parental distress led to increased relational frustration,

which in turn led to higher child behavior problems. The relationship between parenting stress, relational frustration, and behavior problems was also evidenced at post-treatment, indicating that finding support for the same direction of effect that can be drawn from the qualitative findings. Essentially, parental perceptions noted in qualitative responses indicated that their decreased stress, increased patience and ability to remain calm, and reduced impulsivity and tendency to be less reactive while parenting their children contributed to calmer child dispositions and overall less behavior problems. Direct effects in this model are also consistent with those of previous studies demonstrating that both heightened parenting stress and increased parental demands placed on parents of children with DD can lead to increased strain in parent-child relationships and subsequently, coercive dyadic interactions between the parent and child (Anthony et al., 2005; Crnic et al., 2004). Furthermore, research has demonstrated that parents of children with DD often show increased levels of irritation and decreased levels of tolerance related to their child's functioning and behavior to the extent that they experience an inability to effectively cope with disruptive behaviors (Crnic et al., 2005; Hastings, 2002). As such, parenting becomes more coercive, intrusive, and less positive overall, (Blacher, Baker, & Kaladjian, 2013; Crnic et al., 2005; Garner et al., 2013; Hastings, 2002), ultimately leading to increased incidence of behavior problems in children (Deater-Deckard & Scarr, 1996; Jackson, 2000). Thus, interventions aimed at reducing frustration in the parent-child relationship may be especially beneficial for parents of children with DD.

Despite lack of research investigating components of the parent-child relationships as mechanistic factors through which parenting stress and behavior problems specifically relate to one another, parent-child relational variables have been

implicated as playing a mediating role between larger scale family stressors and development of child psychopathology (Grant et al, 2006). Given the prominence of comorbid psychopathology among children with elevated levels of behavior problems (Baker, Neece, Fenning, Crnic, & Blacher, 2010; Cormack, Brown, & Hastings, 2000; Dekker & Koot, 2003), these findings underscore the importance of targeting parent-child relational factors as a potential intervention for both child behavior problems and later development of psychopathology among children with DD.

In the present sample, a unidirectional mediation relationship with parenting stress predicting child behavior problems was supported by the data. Research has evidenced however, a bidirectional relationship between parenting stress and child behavior problems such that increases in parenting stress not only lead to increases in child behavior problems, but increases in child behavior problems also lead to increases in parenting stress (Baker et al., 2003; Neece et al., 2012). A small preliminary study with the Phase 1 MAPS sample actually supported the opposite direction of effect found in the present study, such that child behavior problems led to increases in parent-child relational frustration, which in turn led to increases in parental distress (Dennis & Neece, 2015). As such, it is likely that these relationships are bidirectional in nature and testing the opposite direction of effect may yield additional findings in the future.

Limitations and Future Directions

Although the current study yielded meaningful findings for families affected by DD, several limitations should be considered. According to parent reports on the qualitative questionnaire, there were a number of potential mediating and outcome

variables that could have been examined, but were limited by the data. Given parent reports of changes in adaptive behavior such as toilet training success and expressive communication, this was originally considered as a potential outcome variable in the model. Due to a measure of adaptive functioning only being collected during Phase 2 of the MAPS project however, the current study did not examine adaptive behavior as an outcome. Additionally, qualitative reports indicated a general theme of improved child positive mood, which also could not be examined as a quantitative outcome due to lack of a valid measure in the present sample. Future studies should evaluate both adaptive behavior and child positive affect, as they appear to be meaningful outcomes for parents as well as reflect qualities that can influence parental mental health. As previously mentioned, facets of mindfulness were originally considered as potential mediators of the relationship between parenting stress and child outcomes based on parent reports of increased mindful awareness in their parenting following the intervention. In the future, it may be beneficial to not only to consider the facets of mindfulness as mediators of the relationship between parental mental health and child outcomes at post-treatment, but also as a potential predictor of parent-child relational frustration and child subsequent child outcomes.

Furthermore, quantitative relationships were only examined at intake whereas qualitative outcomes were assessed post-intervention. The rationale for evaluating the quantitative mediation models at intake only was twofold: 1) to evaluate if the proposed relationships derived on the basis of qualitative data were accurately reflected by the proposed quantitative model and 2) to reduce the probability of statistical error (e.g. Type I error) associated with running multiple analyses with the same data. As such, it may be

the case that additional components of the parenting process serve as mechanisms through which change occurs following the intervention. Future analyses will examine change scores in order to assess how measured changes in the variables of interest relate to one another at post-treatment and whether they change as a function of the MBSR intervention. Ultimately, mediation effects should also be investigated bidirectionally at post-treatment as well to determine whether parent-child relational frustration or other proposed mechanisms of effect operate in the present sample according to the opposite direction of effect.

In addition, research has indicated that although reductions in parenting stress are evident immediately following the intervention and are maintained at follow-up, positive changes in child behavior and development may not be apparent initially, but continue to develop over time (Neece, 2013). Thus, future analyses should examine the proposed model at 6-month follow-up in addition to post-treatment in order to obtain the most accurate picture of child outcomes. Also of note in regard to the data analytic plan that was utilized in the current study, it may be informative for future analyses to examine the proposed theoretical model in the Phase 1 and Phase 2 samples separately. Performing these analyses in each subset of the MAPS sample will ultimately allow generalizability of the results to be evaluated. Finally, it is important to note that the qualitative and quantitative components of the current research were conducted within one study, rather than in progression from one study to the next. In order to improve correspondence between qualitative outcomes and quantitative indicators, future mixed-methods research should be conducted such that qualitative data is collected and outcomes are analyzed prior to informing a qualitative measure battery. This would increase the extent to which

directed content analysis outcomes and measures chosen to be indicators of those outcomes in the theoretical model are truly representative of the constructs of interest, and ultimately allow more informed research questions to be evaluated.

Conclusions

Despite inconsistencies across qualitative and quantitative findings, the current study yields significant implications for families affected by DD. To our knowledge, this is the first study to investigate specific components of the parenting process (e.g. parental role expectation and satisfaction, the parent-child relationship, parenting behavior) collectively as mediators to the relationship between parenting stress and child behavior and development. Previous studies in this domain have been limited in number, have solely investigated parenting behavior as a mediator, have generated relatively inconclusive results, and have pointed to a need for further research regarding the mechanisms through which parenting impacts child outcomes (Anthony et al., 2005; Crnic et al., 2005; Deater-Deckard, 1998; Hastings, 2002).

The findings noted here underscore the importance of parent perceptions of stress, parenting processes, and child behavior and development considered in the context of standard methods of construct measurement. Parent perceptions may be implicated in response to treatment, especially within mindfulness interventions and as such, should be given ample attention in regard to parenting intervention outcomes. Although parent-child relational frustration was the only mechanistic process evidenced by the quantitative model in the current study, recognizing that parent-child relational factors such as these impact the relationship between heightened parenting stress and adverse

behavioral outcomes among children with DD will allow interventions to be developed that not only target reducing parenting stress, but specifically target improving the parent-child relationship with the ultimate goal of decreasing behavior problems and increasing developmental gains among children with DD.

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